# INSTRUCTION BOOK

# BENCH TEST KITS

for

# A.R.C. TYPE 15C (AN/ARN-30)

and

# A.R.C. TYPE 15D (AN/ARN-30A)

AIRCRAFT RADIO CORPORATION

BOONTON, NEW JERSEY

October 1953

# INSTRUCTION BOOK

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AIRCRAFT RADIO CORPORATION

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# A TYPICAL ARRANGEMENT OF THE A.R.C. TYPE 15D(AN/ARN-30A) BENCH TEST KIT

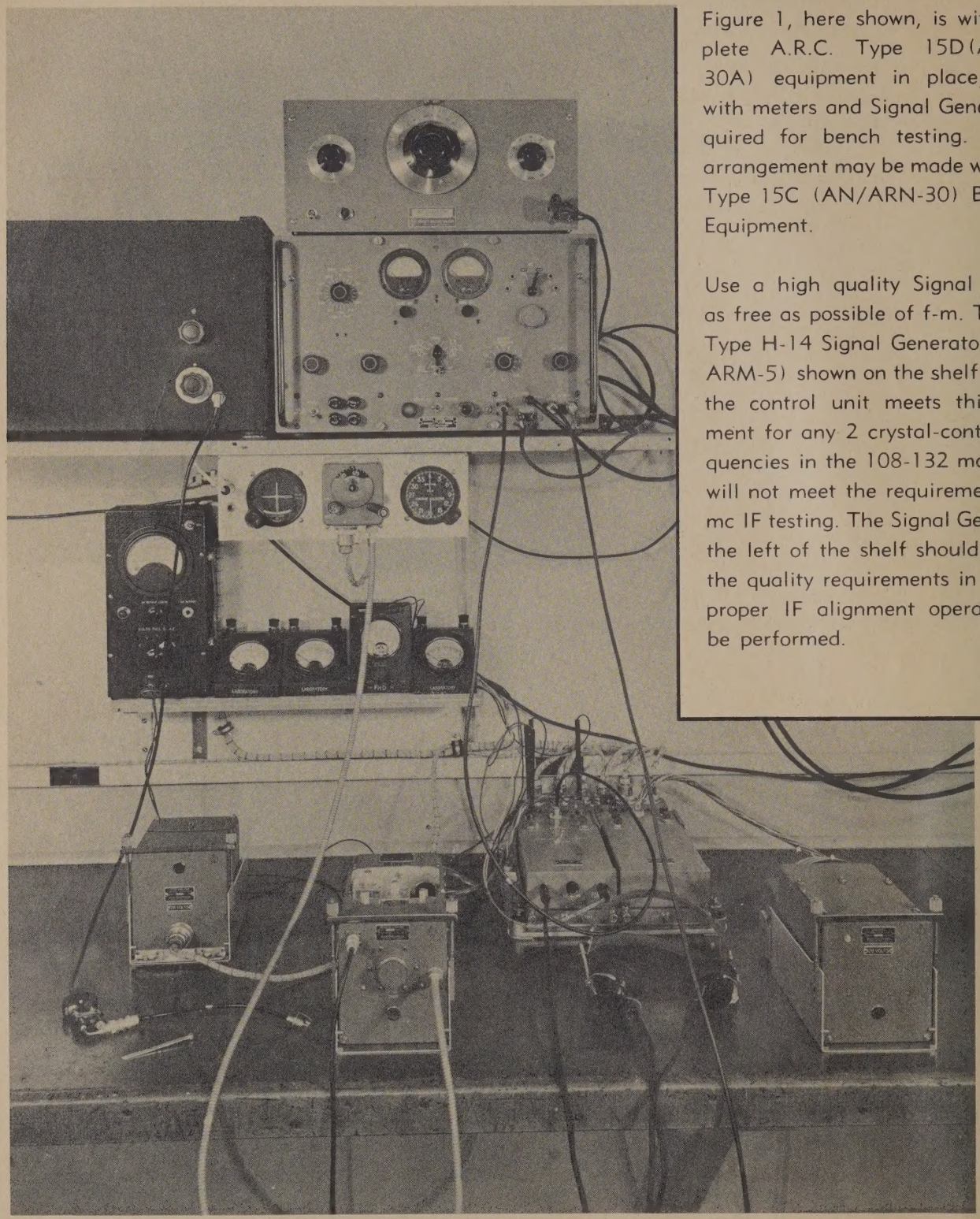


Figure 1, here shown, is with a complete A.R.C. Type 15D(AN/ARN-30A) equipment in place, together with meters and Signal Generators required for bench testing. A similar arrangement may be made with A.R.C. Type 15C (AN/ARN-30) Bench Test Equipment.

Use a high quality Signal Generator as free as possible of f-m. The A.R.C. Type H-14 Signal Generator (SG-66/ARM-5) shown on the shelf just above the control unit meets this requirement for any 2 crystal-controlled frequencies in the 108-132 mc band but will not meet the requirements for 15 mc IF testing. The Signal Generator on the left of the shelf should also meet the quality requirements in order that proper IF alignment operations may be performed.

# TEST EQUIPMENT

The A.R.C. Type 15C (AN/ARN-30) and Type 15D (AN/ARN-30A) Bench Test Kits have been designed to make possible the bench testing of the A.R.C. Type 15C and 15D VHF Navigational Receiving Equipment (Radio Receiving Sets AN/ARN-30 and AN/ARN-30A).

The components required to form a complete Bench Test Kit are listed in the appropriate column of the table below:

COMPONENTS SUPPLIED

| QUANTITY PER KIT | | NAME | A.R.C. PART NO. | ASO STOCK NO. |
|---|---|---|---|---|
| Type 15 C | Type 15 D | | | |
| | | Type 15C (AN/ARN-30) Bench Test Kit | 16101 | R16ARC-FES1017 |
| | | Type 15D (AN/ARN-30A) Bench Test Kit | 16122 | R16ARC-FES1019 |
| 1 | 1 | Bracket Assembly | 16082 | - |
| 2 | 2 | Plug (PL-55) | 7086 | R16P4585 |
| 1 | 1 | Mechanical Linkage Assembly (5 ft.) | 6151 | R16S3872-24 |
| 1 | - | Cable Harness | 16081 | - |
| - | 1 | Cable Harness | 16103 | - |
| 1 | 1 | Receiver Test Harness | 15857 | - |
| 1 | - | Converter Test Harness | 15859 | - |
| - | 1 | Converter Test Harness | 15913 | R16ARC-15913 |
| 3 | 2 | Test Rack | 16083 | - |
| 1 | 1 | Wrench (gang condenser alignment) | 10307 | R16ARC-10307 |
| 1 | 1 | Test Probe | 16139 | - |
| 1 | 1 | Instruction Book | - | - |

One complete Type 15C (AN/ARN-30) Bench Test Kit, plus Cable Harness #16103 and Converter Test Harness #15913 will permit bench testing of either the Type 15C (AN/ARN-30) or 15D (AN/ARN-30A) equipment.

A complete Type 15C (AN/ARN-30) or Type 15D (AN/ARN-30A) equipment less A-13B Antenna (AS-580A/ARN-30) and plugs is required but is not a part of either kit. Signal generators, volt-ohmmeter, headset, and suitable power source are also required but are not a part of either kit. The A.R.C. Type H-14 Signal Generator (SG-66/ARM-5) is recommended for part of the signal generator requirement. For 15 mc IF tests, an additional signal generator is required.

The following measurements and tests may be made on Type 15C(AN/ARN-30) or 15D(AN/ARN-30A) equipment:

a). Measurement of input voltage (normally 14v or 28v depending on the equipment under test).

b). Measurement of dynamotor high voltage output.

c). Measurement of cathode current for AVC check.

d). Measurement of Receiver RF and IF sensitivity.

e). Measurement of "tuning meter" current.

f). Measurement of navigational audio input voltage to converter.

g). Measurement of Receiver audio output.

h). Measurement of Receiver tuning calibration.

i). Measurement of Course Selector accuracy.

j). Test operation of Cross-Pointer Meter and To/From Meter

k). Test operation of Rack.

l). Provides for volt-ohmmeter circuit analysis of all units.

Initial trouble shooting is usually accomplished by replacing one unit of a normally operative installation with a unit under suspicion. Test Racks #16083 make it possible to secure a major unit to a bench in either right-side-up, or upside-down positions for circuit and component analysis.

Refer to instruction books for the Type 15C(AN/ARN-30) and 15D(AN/ARN-30A) equipment for test details, component values, and voltages.

## MILITARY INSTRUCTION BOOKS

| | RADIO RECEIVING SET AN/ARN-30 | RADIO RECEIVING SET AN/ARN-30A |
|---|---|---|
| Operating Instructions | AN16-45-131 | AN16-30ARN30-1 |
| Maintenance Instructions | AN16-45-132 | - |
| Service Instructions | - | AN16-30ARN30-2 |
| Overhaul Instructions | - | AN16-30ARN30-3 |
| Parts Breakdown | AN16-45-133 | AN16-30ARN30-4 |

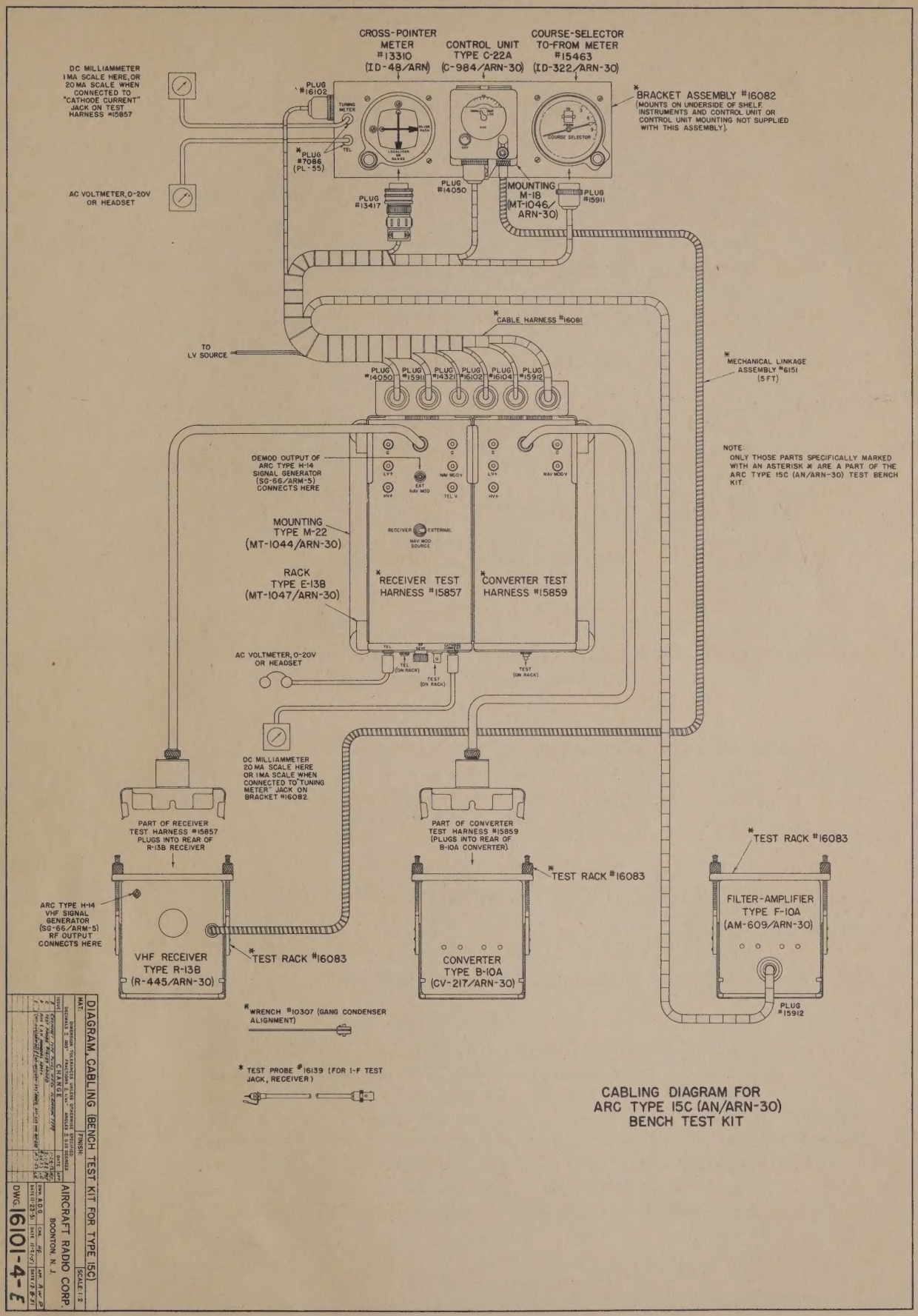

CROSS-POINTER METER #13310 (ID-48/ARN)
CONTROL UNIT TYPE C-22A (C-984/ARN-30)
COURSE-SELECTOR TO-FROM METER #15463 (ID-322/ARN-30)
DC MILLIAMMETER 1MA SCALE HERE, OR 20MA SCALE WHEN CONNECTED TO "CATHODE CURRENT" JACK ON TEST HARNESS #15857
AC VOLTMETER, 0-20V OR HEADSET
*PLUG #16102
*PLUG #7086 (PL-55)
PLUG #13417
PLUG #14050
*BRACKET ASSEMBLY #16082 (MOUNTS ON UNDERSIDE OF SHELF. INSTRUMENTS AND CONTROL UNIT OR CONTROL UNIT MOUNTING NOT SUPPLIED WITH THIS ASSEMBLY).
MOUNTING M-18 (MT-1046/ARN-30)
PLUG #15911
*CABLE HARNESS #16081
TO LV SOURCE
PLUG #14050
PLUG #15911
PLUG #14321
PLUG #16102
PLUG #16104
PLUG #15912
*MECHANICAL LINKAGE ASSEMBLY #6151 (5 FT)
NOTE: ONLY THOSE PARTS SPECIFICALLY MARKED WITH AN ASTERISK * ARE A PART OF THE ARC TYPE 15C (AN/ARN-30) TEST BENCH KIT.
DEMOD OUTPUT OF ARC TYPE H-14 SIGNAL GENERATOR (SG-66/ARM-5) CONNECTS HERE
MOUNTING TYPE M-22 (MT-1044/ARN-30)
RACK TYPE E-13B (MT-1047/ARN-30)
*RECEIVER TEST HARNESS #15857
*CONVERTER TEST HARNESS #15859
AC VOLTMETER, 0-20V OR HEADSET
DC MILLIAMMETER 20 MA SCALE HERE OR 1MA SCALE WHEN CONNECTED TO "TUNING METER" JACK ON BRACKET #16082.
PART OF RECEIVER TEST HARNESS #15857 PLUGS INTO REAR OF R-13B RECEIVER
PART OF CONVERTER TEST HARNESS #15859 (PLUGS INTO REAR OF B-10A CONVERTER)
*TEST RACK #16083
*TEST RACK #16083
*TEST RACK #16083
ARC TYPE H-14 VHF SIGNAL GENERATOR (SG-66/ARM-5) RF OUTPUT CONNECTS HERE
VHF RECEIVER TYPE R-13B (R-445/ARN-30)
CONVERTER TYPE B-10A (CV-217/ARN-30)
FILTER-AMPLIFIER TYPE F-10A (AM-609/ARN-30)
PLUG #15912
*WRENCH #10307 (GANG CONDENSER ALIGNMENT)
* TEST PROBE #16139 (FOR I-F TEST JACK, RECEIVER)
CABLING DIAGRAM FOR ARC TYPE 15C (AN/ARN-30) BENCH TEST KIT
DIAGRAM, CABLING (BENCH TEST KIT FOR TYPE 15C)
AIRCRAFT RADIO CORP. BOONTON, N. J.
DWG. 16101-4-E

Figure 2. Cabling Diagram, A.R.C. Type 15C (AN/ARN-30) Bench Test Kit

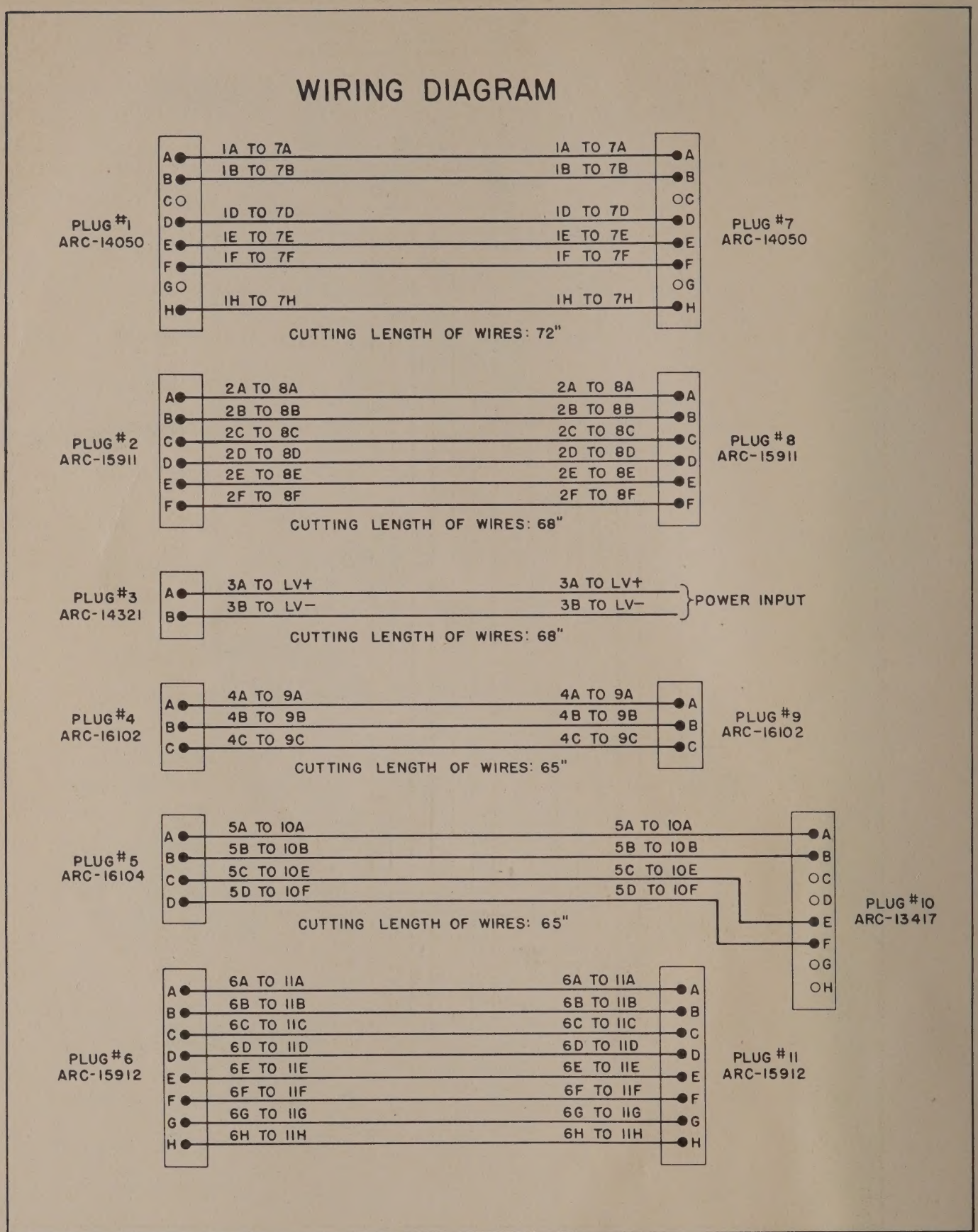
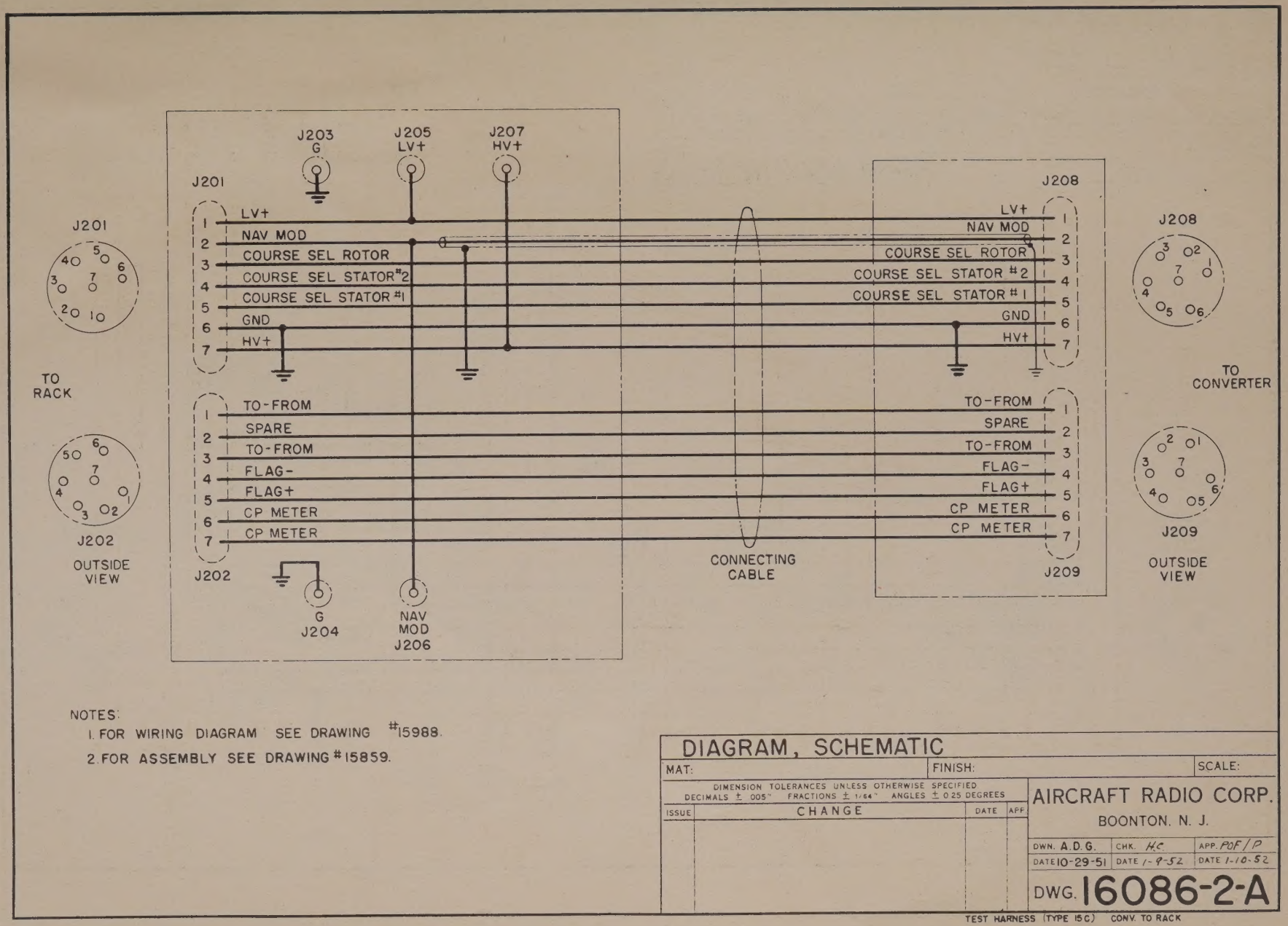



Figure 3. Wiring Diagram, Cable Harness A.R.C. #16081 as used in Type 15C (AN/ARN-30) Bench Test Kit




NOTES:
1. FOR WIRING DIAGRAM SEE DRAWING #15988.
2. FOR ASSEMBLY SEE DRAWING #15859.

DIAGRAM, SCHEMATIC

MAT: | FINISH: | SCALE:

DIMENSION TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS ± .005" FRACTIONS ± 1/64" ANGLES ± 0.25 DEGREES

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BOONTON, N. J.

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|---|---|---|
| DATE 10-29-51 | DATE 1-9-52 | DATE 1-10-52 |

DWG. 16086-2-A

TEST HARNESS (TYPE 15C) CONV. TO RACK

Figure 4. Schematic Circuit Diagram of A.R.C. #15859 Test Harness
Part of A.R.C. Type 15C (AN/ARN-30) Bench Test Kit

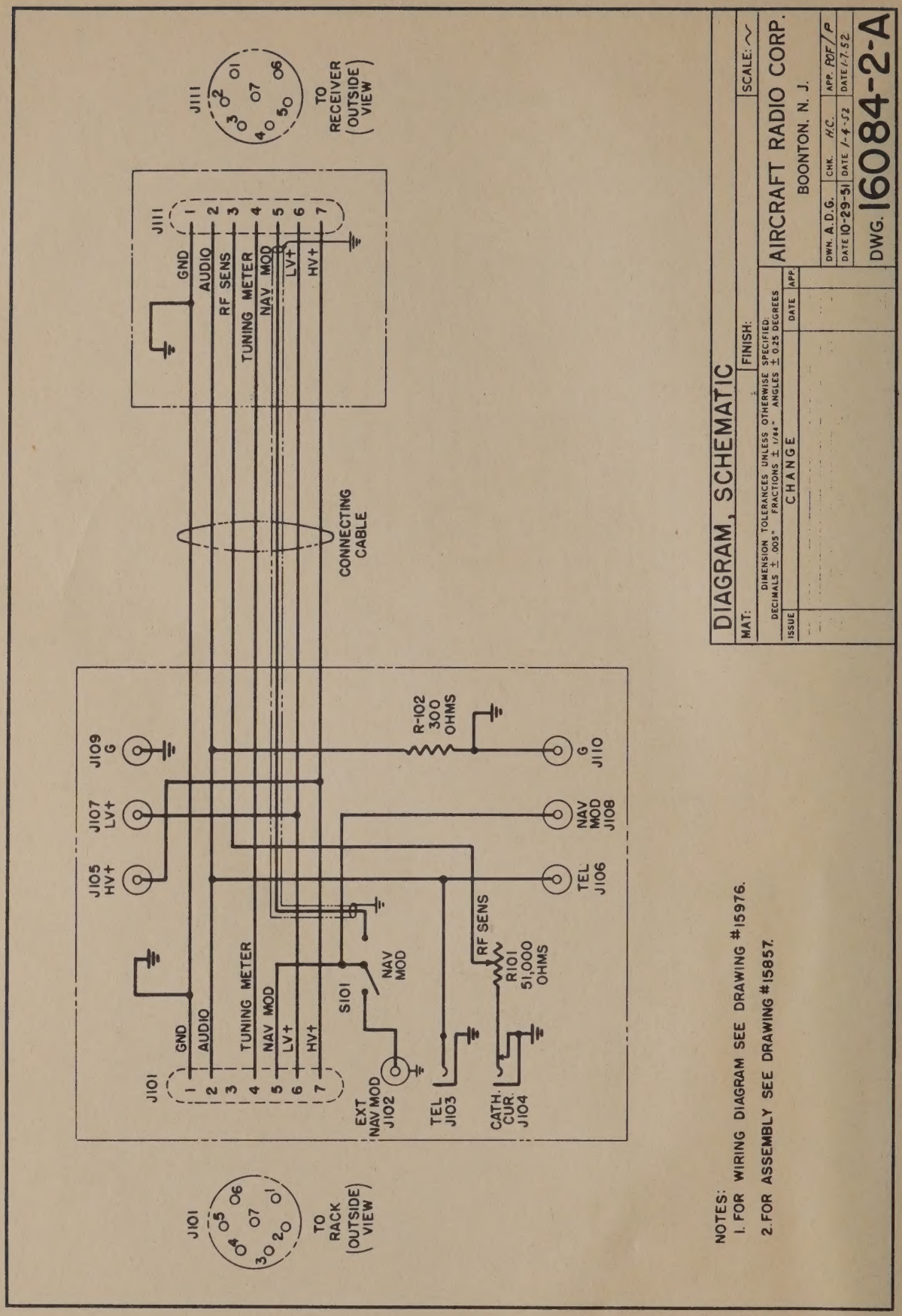



Figure 5. Schematic Circuit Diagram of A.R.C. #15857 Test Harness
Part of A.R.C. Types 15C (AN/ARN-30) and 15D (AN/ARN-30A)
Bench Test Kits

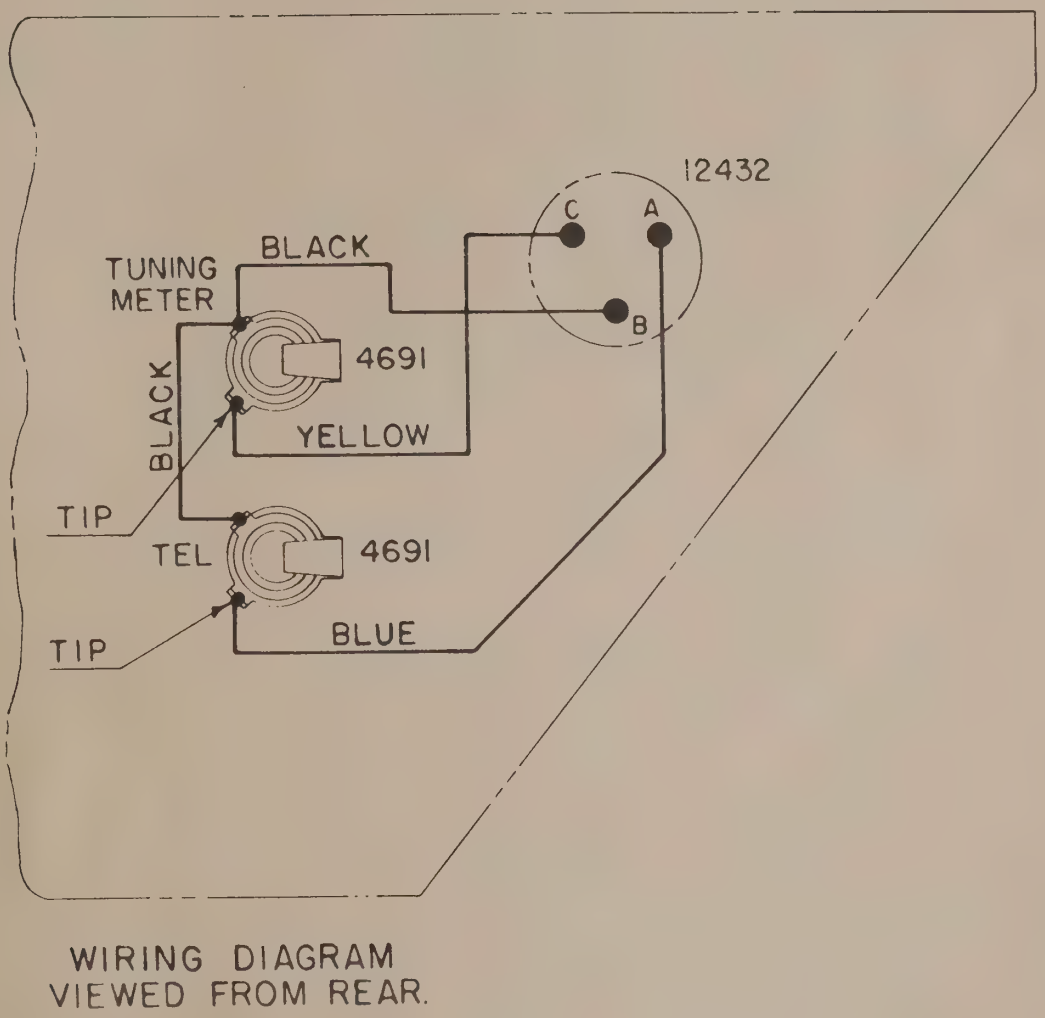



Figure 6. Wiring on A.R.C. #16082 Bracket Assembly
Part of A.R.C. Types 15C (AN/ARN-30)
and 15D (AN/ARN-30A) Bench Test Kits

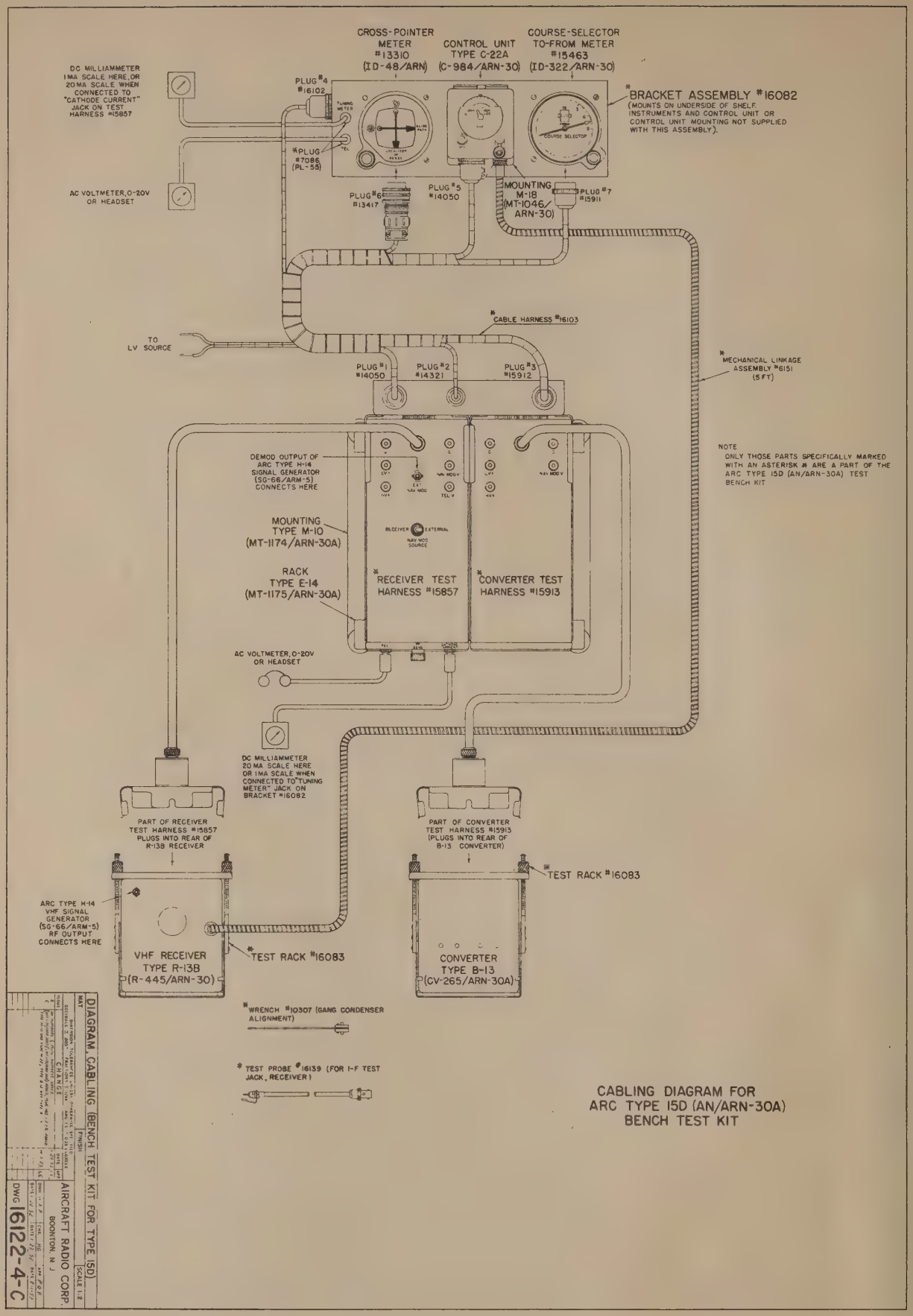

CROSS-POINTER METER #13310 (ID-48/ARN)
CONTROL UNIT TYPE C-22A (C-984/ARN-30)
COURSE-SELECTOR TO-FROM METER #15463 (ID-322/ARN-30)
DC MILLIAMMETER 1MA SCALE HERE, OR 20MA SCALE WHEN CONNECTED TO "CATHODE CURRENT" JACK ON TEST HARNESS #15857
PLUG #4 #16102
*BRACKET ASSEMBLY #16082 (MOUNTS ON UNDERSIDE OF SHELF. INSTRUMENTS AND CONTROL UNIT OR CONTROL UNIT MOUNTING NOT SUPPLIED WITH THIS ASSEMBLY).
*PLUG #7086 (PL-55)
AC VOLTMETER, 0-20V OR HEADSET
PLUG #6 #13417
PLUG #5 #14050
MOUNTING M-18 (MT-1046/ARN-30)
PLUG #7 #15911
*CABLE HARNESS #16103
TO LV SOURCE
PLUG #1 #14050
PLUG #2 #14321
PLUG #3 #15912
*MECHANICAL LINKAGE ASSEMBLY #6151 (5 FT)
NOTE
ONLY THOSE PARTS SPECIFICALLY MARKED WITH AN ASTERISK * ARE A PART OF THE ARC TYPE 15D (AN/ARN-30A) TEST BENCH KIT
DEMOD OUTPUT OF ARC TYPE H-14 SIGNAL GENERATOR (SG-66/ARM-5) CONNECTS HERE
MOUNTING TYPE M-10 (MT-1174/ARN-30A)
RACK TYPE E-14 (MT-1175/ARN-30A)
*RECEIVER TEST HARNESS #15857
*CONVERTER TEST HARNESS #15913
AC VOLTMETER, 0-20V OR HEADSET
DC MILLIAMMETER 20 MA SCALE HERE OR 1MA SCALE WHEN CONNECTED TO "TUNING METER" JACK ON BRACKET #16082
PART OF RECEIVER TEST HARNESS #15857 PLUGS INTO REAR OF R-13B RECEIVER
PART OF CONVERTER TEST HARNESS #15913 (PLUGS INTO REAR OF B-13 CONVERTER)
*TEST RACK #16083
ARC TYPE H-14 VHF SIGNAL GENERATOR (SG-66/ARM-5) RF OUTPUT CONNECTS HERE
VHF RECEIVER TYPE R-13B (R-445/ARN-30)
*TEST RACK #16083
CONVERTER TYPE B-13 (CV-265/ARN-30A)
*WRENCH #10307 (GANG CONDENSER ALIGNMENT)
* TEST PROBE #16139 (FOR I-F TEST JACK, RECEIVER)
CABLING DIAGRAM FOR ARC TYPE 15D (AN/ARN-30A) BENCH TEST KIT
DIAGRAM, CABLING (BENCH TEST KIT FOR TYPE 15D)
AIRCRAFT RADIO CORP.
BOONTON, N. J.
DWG 16122-4-C

Figure 7. Cabling Diagram, A.R.C. Type 15D (AN/ARN-30A) Bench Test Kit

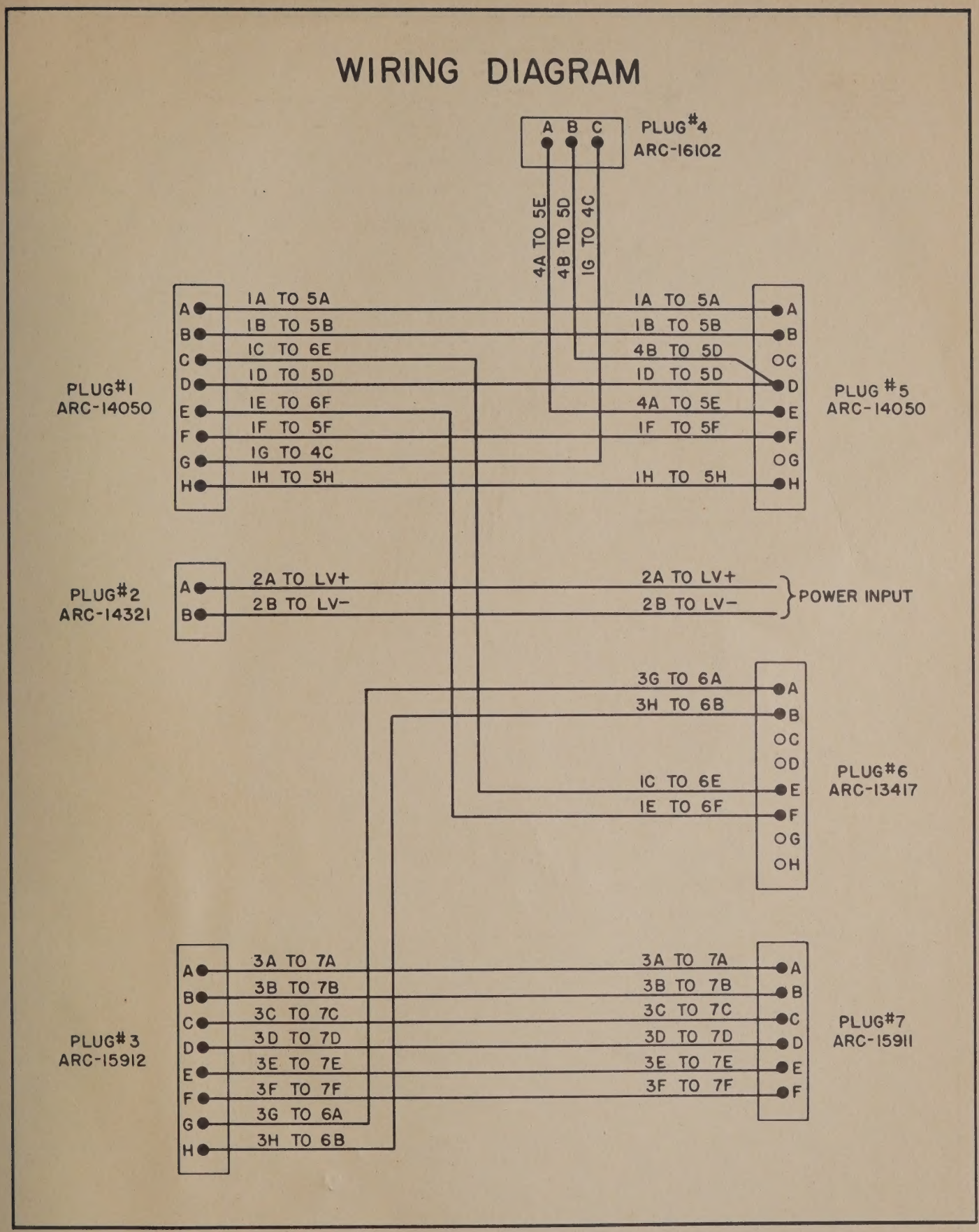
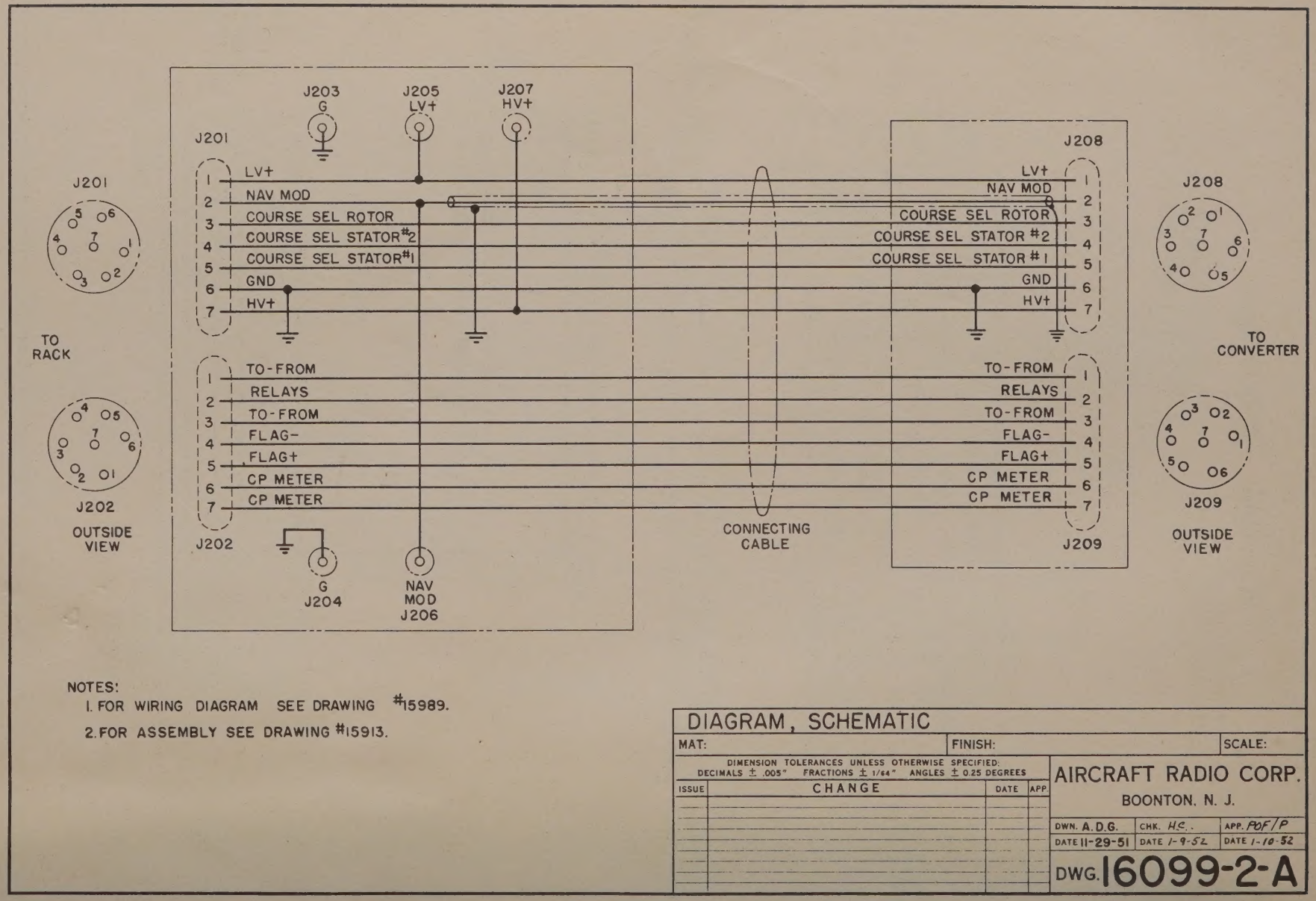



Figure 8. Wiring Diagram, Cable Harness A.R.C. #16103
A.R.C. Type 15D (AN/ARN-30A) Bench Test Kit




NOTES:
1. FOR WIRING DIAGRAM SEE DRAWING #15989.
2. FOR ASSEMBLY SEE DRAWING #15913.

DIAGRAM, SCHEMATIC

| MAT: | FINISH: | SCALE: |
|---|---|---|

DIMENSION TOLERANCES UNLESS OTHERWISE SPECIFIED:
DECIMALS ± .005" FRACTIONS ± 1/64" ANGLES ± 0.25 DEGREES

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DWG. 16099-2-A

Figure 9. Schematic Circuit Diagram of A.R.C. #15913 Test Harness
Part of A.R.C. Type 15D (AN/ARN-30A) Bench Test Kit

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